



## HAGEO for AIX and GeoRM for AIX on IBM @server pSeries



### **Disaster recovery excellence**

Today, keeping a business operational increasingly means keeping critical data and information systems available around the clock. To compete successfully in the global marketplace, companies are striving to protect critical information systems to help minimize costly business impacts, such as lost sales, decreased customer satisfaction and reduced employee productivity.

One aspect of high availability is protection against location disasters, such as power outages, hardware or software failures, and natural disasters. This is accomplished by eliminating the system and the site as points of failure.

Two software products provide differing levels of disaster recovery features for IBM @server pSeries™ and IBM RS/6000® UNIX® systems. Geographic Remote Mirror (GeoRM) for AIX protects critical data by duplicating the most up-to-date data reliably and quickly at a remote location. High Availability Geographic Cluster (HAGEO) for AIX helps keep mission-critical systems and applications operational in the event of disasters.

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### *Highlights*

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**Provides disaster recovery and resynchronization capability for geographically separated sites**

**Protects data against total location failure by remote mirroring of data**

**Supports unlimited distance between participating sites**

**Performs automatic site takeover and recovery**

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### *New Features of 2.4*

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**Improved network performance capability with the addition of the TCP transport option**

**64-bit kernel support**

**Additional choices in the write ordering of mirrored data**

**Tighter integration with IBM's High Availability Cluster Multiprocessing (HACMP) for AIX® clustering software**

HAGEO provides the geographic mirroring functions of GeoRM and adds automatic failover and recovery capabilities.

## **GeoRM**

GeoRM is a data mirroring product that provides a point-to-point method of duplicating the customer data in real-time over unlimited geographic distances. Since GeoRM is both database and file system independent, there is no modification required of applications that utilize GeoRM's mirroring capabilities.

Businesses can be assured that GeoRM is designed to mirror any data destined for one server (the source server) across any IP-based network to another server (the target server). A total failure (e.g., CPU, disk, network, power) of the source server at the local site will not cause the loss of data on the target server at the remote site.

GeoRM has the ability to continue operations while recovering from a server failure. Since a target server can support up to seven source servers in GeoRM, the flexibility to design the correct backup configuration serves all types of business recovery needs and allows business applications to continue running on the takeover system while you recover from a disaster or planned outage. Each of these source and target servers can be as near (in the same room)

or as far (halfway around the world) as required.

GeoRM offers a wide range of mirroring configurations allowing for the most stringent data integrity mode to a higher performance mode. Data between the GeoRM sites can be mirrored in three modes:

- Synchronous mode helps ensure that the same data exists on both sites at the completion of every write. This mode provides a high level of data integrity.
- Synchronous with mirror write consistency helps ensure that both sites can be restored with identical data, even in the event of a site failure in mid-transaction. This mode provides data integrity and better performance results.
- Asynchronous mode writes on the local disk without waiting for the remote write to complete. All data may not be on the remote site when a site failure occurs. This mode is chosen when performance is the highest priority in disaster recovery.

GeoRM is suitable for all customers, from small and medium-sized companies to large corporate enterprises. It is scalable and flexible across the entire range of IBM AIX servers.

## **HAGEO**

HAGEO supports the same critical data mirroring functions as GeoRM like point-to-point mirroring, three mirroring modes, and backup configuration flexibility. Not only is data protected, but HAGEO also has built-in features to automatically respond to site and communication failures and provide for automatic site takeover.

An HAGEO cluster consists of two geographically separated sites, supporting a total of eight systems. There are three types of disaster protection: remote hot backup, remote mutual takeover and concurrent access.

### **Remote hot backup**

A remote geographic site is designated as the hot backup site. This backup site includes hardware, system and application software, and application data and files. It is live and ready to take-over the current workload. In the event of a failure, the failed site's application workload automatically transfers to the remote hot backup site.

### **Remote mutual takeover**

Remote mutual takeover takes remote hot backup a little further and allows geographically separated system sites to be designated as hot backups for each other. Should either site experience a failure, the other acts as a hot backup and automatically

takes over the designated application workload of the failed site. Two different workloads running at two different sites are protected!

### **Concurrent access**

Concurrent access configurations have systems at both sites concurrently updating the same database. Users run instances of the same application at both sites for increased system throughput and extremely fast failover. HAGEO is one of the few products to have this ability.

### **Remote system recovery**

Because of the above types of disaster protection, after a failed site has been restored to operation, HAGEO can resynchronize mission-critical data and reintegrate the failed system with the remote hot backup. HAGEO updates the failed system with a current mirror of application data and files processed by the backup system after the failed system ceased operations. Upon completing restoration of an up-to-date data and file mirror, the HAGEO cluster will resume synchronized system operations, including the mirroring of real-time data and files between the system sites. This can occur while the remote backup is currently in user operation.

### **Complete availability lineup**

HAGEO is complemented by a third IBM AIX high availability

product, High Availability Cluster Multiprocessing (HACMP) for AIX, which can be used for local or campus disaster survivability with real-time automated failover and reintegration for up to 32 servers. HACMP can protect against local system and application failures, preserve data integrity and consistency, and maintain cluster operations during unplanned and planned downtime. This strong lineup provides IBM AIX system customers with a wide choice of high availability and disaster recovery technologies.

When assessing the benefits of HAGEO, GeoRM, or HACMP, consider the following benefits:

**GeoRM:** can provide an environment to mirror data to another location. It can provide remote data mirroring for backup of regional (up to seven) locations to a single centralized server or between just two geographically separate servers. GeoRM is mutually exclusive and cannot be used in conjunction with HAGEO.

**HAGEO:** can quickly restore access to data following a location failure. HAGEO provides the same functionality as GeoRM, and, together with HACMP, it can automate failover, recovery and reintegration between geographically separate locations.

**HACMP:** can keep mission-critical applications highly

available within a location through application failover and monitoring.

## **HAGEO/GeoRM**

### **Key Features**

- *New:* Support for both UDP and TCP transport options.
- *New:* 64-bit kernel support for the TCP protocol.
- *New:* Choice of “Write Ordering by Volume Group” under the TCP transport option which can realize performance gains.
- *New:* Tighter integration with HACMP simplifies configuration of both products.
- Allows automatic detection and response to site and network failures in the geographic cluster without user intervention.
- Provides load balancing across the links and enhanced by choosing the fastest path.
- Removes the AIX limitation of three mirror copies of a disk and allows three copies at each geographic site.
- Wider range of data transmission rates, allowing more efficient use of networks and better tuning of network utilization.
- Support for maximum sized logical volumes

## For more information

To learn more about HAGEO and GeoRM on IBM eServer pSeries servers, contact your IBM marketing representative or IBM Business Partner or visit the following Web sites:

**ibm.com/servers/eserver/pseries**  
**ibm.com/**  
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Marketing Communications  
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10-02  
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